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ABSTRACT

Two bibliographies that review 18 books and resource materials that adult educators can use to teach mathematics in adult literacy classes are included. The materials are suggested to help teachers implement an effective, successful mathematics program, using many of the strategies recommended by the National Council of Teachers of Mathematics. Titles, authors, publisher and address, cost and detailed summaries are provided for each resource. Books and resources provide information on teaching methods, suggested activities, curriculum, and using manipulatives. The following titles are included: "Spaces: Solving Problems of Access in Engineering and Science"; "Get It Together: Math Problems for Groups"; "Problems Plus: Mathematical Problem Solving"; "Family Math" (Jean Stenmark et al.); "Math for Smarty Pants" (Marilyn Burns); "GED Math Problem Solver" (Myrna Manly); "Mental Math in the Primary Grades/Middle Grades/Junior High" (Jack A. Hope et al.); "When Are We Ever Gonna Have to Use This?" (Hal Saunders); "Mathematicians Are People, Too" (Luetta and Wilbert Reimer); "Elementary School Mathematics: Teaching Developmentally (Second Edition)" (John A. Van De Walle); "About Teaching Mathematics: A K-8 Resource" (Marilyn Burns); "Mathematicians Are People, Too, Volume II" (Luetta Reimer and Wilbert Reimer); "Problem Solving: A Basic Mathematics Goal. Volumes 1-2" (Steven P. Meiring); "Group Solutions: Cooperative Logic Activities for Grades K-4" (Jan M. Goodman); "Let's Pattern Block It" (Peggy McLean et al.); "Fractions with Pattern Blocks" (Mathew E. Zullie); "Problem Solving with Pentominoes: Grades 1-4 Activity Book" (Alison Abrohms); and "Square Tile: Explorations and Problems: Grades 4-9" (Don Miller and Bishne Naraine). Sources for purchasing the publications are listed. (KC)

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Students experience a range of mathematics topics in developing logical reasoning and problem-solving skills. Students estimate, guess, predict, and create mathematical or physical models, all of which are components of the scientific process.

Many activities involve six students in a cooperative activity, which incorporates reading and language. These activities are appropriate for pre-GED and GED-level students.

Get It Together: Math Problems for Groups

Editor: Tim Erickson
Curriculum Developers: Bill Finzer, Lynne Alper, Paul Giganti, Sherry Fraser, Kay Gilliland, Gary Tsuruda,
Developed by: Lawrence Hall of Science (1989) University of California Berkeley, CA 94720 (510) 642-1910
Cost: $18.00

This is a collection of cooperative-learning activities. The information the group needs to solve a problem has been put on clue cards. Each member of the group has a different bit of information, so everyone has to cooperate to solve the problem. This is an exceptionally easy format for teachers who want to begin using cooperative activities in mathematics.

Discussion about this method of solving problems has generated the following comments:

"Everyone has a part to do."
"It's easier with many brains."
"I saw someone work the problem a different way."
"The group used a lot of math words in the discussion."
"We knew when we are right."

One advantage of this method is that there are fewer units to supervise, therefore the teacher can spend more time observing the students and their progress as they begin to "own" their problem-solving skills. Group work also appeals to more modalities and easily accommodates other disciplines in the math classroom. The success in solving problems is a big morale booster. All students, including pre-GED, ESL and advanced GED, benefit from learning to explain themselves more clearly and can work together on these activities. "Weak" students become effective and contributing group members, and "strong" students learn that they can get in the way of a group's solution. Learning to work together is an important skill in today's world.

Although the book lists the problems as being appropriate for grades 4-12, they are extremely appropriate for adult education students--pre-GED, GED, and ESL.

Problems Plus: Mathematical Problem Solving

Developed by: Berrent Publications (1994)
1025 Northern Boulevard
Roslyn, NY 11576
800-74-LEARN
Cost: $8.00

This series of short books (A through E, grade levels 1 through 5) includes critical-thinking strategies, higher-order thinking, multi-step problems, and open-ended questions. Each book contains three units. The first unit, *Math Strategies*, includes a five-step problem-solving plan that demonstrates two different ways to think about math problems. The second unit, *Open-Ended Problems*, focuses on real-life situations that require math problem solving. The last unit, *Open-Ended Problems Plus*, includes math "essay" questions that are more complex and may have several answers. A math scoring rubric is explained in this unit.

This book is easy to read and contains interesting problems. The problem-solving skills are very appropriate for pre-GED, GED, and ESL students.

Family Math

Authors: Jean Kerr Stenmark, Virginia Thompson, and Ruth Cossey
Developed by: Lawrence Hall of Science (1986) University of California Berkeley, CA 94720 (510) 642-1910
Cost: $18.00

Family Math is about parents and children working together, learning to like mathematics, and doing activities that make math fun for children 5-12 years old. It can also be used in the pre-GED, GED, and ESL classroom. The topics include word problems, logical reasoning, measurement, geometry, spatial thinking, probability, statistics, calculators, estimation, and basic arithmetic.

This book is a valuable resource for all levels of adult basic and literacy education classes as well as family literacy programs such as Even Start.

Math for Smarty Pants

Author: Marilyn Burns
Publisher: Yolla Bolly Press (1982)
Cost: $12.00

This is a good resource book for teachers to use to help students develop thinking skills and to obtain problems for classwork. The activities offer a common-sense approach to math fundamentals for those students and teachers who are slightly terrified of math as well as those students and teachers who love math! The illustrations are geared to middle school students, although some adult students have found them delightful. The book could easily be used as a series of units to promote and teach problem solving.

Other Marilyn Burns books, such as The Book of Think: or How to Solve a Problem Twice Your Size (1976), are also good resources for math thinking and problem solving. The Book of Think covers general problem-solving strategies and new ways of looking at math, as well as other parts of life.

GED Math Problem Solver

Author: Myrna Manly
Publisher: Contemporary Books (1992)
Department S 92
180 N. Michigan Avenue
Chicago, Illinois 60601
(800) 621-1918
Cost: $8.25

Myrna Manly has been involved in the development of the official GED math test. She developed this book to meet the "thinking" needs of students. This book teaches exactly what is needed for the GED math test. It is concise and to the point. Students with a reading level of sixth or seventh grade can use this book. One difficulty with the book may be the open registration policy of most GED classes because the book is sequential and it would be difficult for students to start in the middle. The format takes a bit of getting used to since the chapters are not "self-contained." For example, there is no "algebra" chapter; algebra is incorporated throughout the book.

The GED Math Problem Solver has a very different approach than most other GED books. It can be a wonderful resource book for both teacher and student.

Mental Math in the Primary Grades
Mental Math in the Middle Grades
Mental Math in Junior High

Authors: Jack A. Hope, Marbara J. Reys, and Robert E. Reys
Publisher: Dale Seymour Publications
(1987) P.O. Box 10888
Palo Alto, CA 94303
(800) 872-1100
Fax: (415) 324-3424

This series develops students' ability to calculate mentally without reliance on paper or pencil. It helps streamline their work in estimation and helps them better understand place value, mathematical operations, and basic number properties. These books contain 50 reproducible lessons in five units which include:

1. Mentalmathlete page including anecdotes about experts in mental calculation and a special student challenge.
2. 7 - 8 lessons that introduce important strategies for calculating "in your head."
3. 2 - 3 "Mental Math in Daily Life" lessons.
4. A review page for practice.
5. A unit test.

The format is easy to use and builds the skills of both teacher and student. All answers are included.

When Are We Ever Gonna Have to Use This?

Author: Hal Saunders
Publisher: Dale Seymour Publications
(1988) P.O. Box 10888
Palo Alto, CA 94303
(800) 872-1100
Fax: (415) 324-3424
Cost: $10.00

Hal Saunders interviewed people representing 100 different occupations to find out what math topics they used and how they used them. Using their answers, he developed a chart and over 350 word problems that apply to each occupation. Problems explore percent, volume, formulas, probability, ratio and proportion, the Pythagorean theorem, measurement and conversion, fractions, decimals, averages, linear equations, statistical graphing, area and perimeter, and elementary algebra.

Mathematicians Are People, Too: Stories from the Lives of Great Mathematicians

Authors: Luetta Reimer and Wilbert Reimer
Publisher: Dale Seymour Publications
(1990) P.O. Box 10888
Palo Alto, CA 94303
(800) 872-1100
Fax: (415) 324-3424
Cost: $13.00

This book includes 15 stories about the lives of the people behind great mathematical discoveries. These stories can be used for background information for teachers or for students to read and discuss. The reading level is pre-GED, but the information would be appropriate for all levels.

There are many math books that give tips and techniques to improve one's mental math skills. Many of these books deal with math anxiety also. One book, Where Do I Put the Decimal Point: How to Conquer Math Anxiety and Increase Your Facility with Numbers, is an excellent book that deals with patterns, whole numbers, decimals, fractions, proportions, percents and block algebra. Unfortunately this book (like many math books) is already out of print. Nevertheless, these types of books are often available at book stores at reduced prices. Teachers might want to look through the "half price" books in order to find worthwhile, inexpensive math books such as this one.

THE OHIO LITERACY RESOURCE CENTER IS LOCATED AT KENT STATE UNIVERSITY
414 WHITE HALL, P.O. BOX 5190, KENT, OH 44242-0001
1-800-765-2897 OR 216-672-2007 E-MAIL ADDRESS: OLRC@KENTVM.KENT.EDU

Ohio Literacy Resource Center

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Enhancing adult literacy in the State of Ohio

Program Resources

ANNOTATED BIBLIOGRAPHY OF MATHEMATICS RESOURCES: VOLUME II

by Nancy L. Markus

Many adult education and workplace education teachers in Ohio are aligning their instruction with the National Council of Teachers of Mathematics (NCTM) standards in order to provide more effective, beneficial instruction. The following are additional recommended readings and activities that will help you implement an effective, successful mathematics program, using many of these strategies. These suggested materials are of high quality, have practical use, are readily available, and are not typical GED or pre-GED textbooks. Current adult mathematics teachers throughout the United States have recommended the resources.

If you wish to purchase books and manipulatives, you can call or write the publisher directly (see information accompanying each annotation) or contact one of the these companies. Many of the books are available from:

The Math Learning Center
P.O. Box 3226
Salem, Oregon 97302
(503) 370-8130
Fax: (503) 370-7961

Note: The Math Learning Center has no shipping charges for delivery within the United States.

Tricon Publishing
2150 Enterprise Drive
Mt. Pleasant, Michigan 48858
(517) 772-2811
Fax: (517) 773-5894

Please note that the quoted prices are approximate and may vary slightly from publisher to publisher. Dale Seymour publications are often available from other resources, such as those listed above, and often at a lower cost.

Many resources can be borrowed from your ABLE Regional Resource Centers. If you have trouble locating an item, please contact the Ohio Literacy Resource Center.

ELEMENTARY SCHOOL MATHEMATICS: Teaching Developmentally (second edition)

Author: John A. Van De Walle
Publisher: Longman (1994)
10 Bank Street
White Plains, New York 10606
Cost: $50.00

While an expensive text, this book is the "gold standard" for teaching mathematics. The book covers the following: reflections and directions of teaching mathematics, learning in a mathematics environment, developing understanding in mathematics, developing problem-solving processes, assessment, the development of number concepts and number sense, developing meanings for operations, mastering the basic facts, whole number place-value development, pencil-and-paper computation with whole numbers, mental computation and estimation, developing fractions concepts, computing with fractions, decimal and percent concepts and decimal computing,

developing the concepts of ratio and proportion, developing measurement concepts, geometric thinking and concepts, logical reasoning, exploring beginning concepts of probability and statistics, preparing for algebra, technology and mathematics, planning for developing instruction, and mathematics and students with special needs.

This 500+ page book gives concrete activities and teaching suggestions as well as information on how concepts are learned in order to maximize the benefits of instruction. This reference book includes black line masters that can be used in a variety of ways. The mathematics presented is geared from beginning concepts to early high school math. It provides a sound foundation for more advanced concepts. It is highly recommended and appropriate for pre-GED, GED, ESL, and college developmental classes.

About Teaching Mathematics: A K-8 Resource

Author: Marilyn Burns
Publisher: Math Solutions Publications
Distributed by: Cuisinaire Company of America (1992)
P.O. Box 5026
White Plains, NY 10602-5026
(800) 237-3142
Cost: $28.00

This book reflects current ideas about mathematics education. The first part of the book looks at the issues of mathematics reform, including using word problems to develop arithmetic understanding, going beyond word problems, and managing the classroom for problem solving. The second part looks at problem solving in each of the strands of measurement, probability and statistics, geometry, logic, patterns and functions, and number sense. Finally, the third part looks at specific topics such as number concepts, place value, addition and subtraction, multiplication, division, fractions, decimals, and percents.

This book includes rationale and activities that are appropriate for both pre-GED and GED students. It includes blackline masters and an extensive bibliography.

Mathematicians Are People, Too: Stories from the Lives of Great Mathematicians, Volume II

Authors: Luetta Reimer and Wilbert Reimer
Publisher: Dale Seymour Publications (1995)
P.O. Box 10888
Palo Alto, CA 94303
(800) 872-1100
Fax: (415) 324-3424
Cost: $13.00

This book contains another fifteen stories about the lives of the people behind great mathematical discoveries and ideas. These stories, which include some about women and minorities, can be used as background information for teachers or for students to read and discuss. The reading level is pre-GED, but the information would be appropriate for all levels.

PROBLEM SOLVING...a basic mathematics goal. Becoming a better problem solver - Volume 1
PROBLEM SOLVING...a basic mathematics goal. A resource for problem solving - Volume 2

Prepared by: Steven P. Meiring
Published by: Ohio Department of Education (1982)
Division of Inservice Education
65 South Front Street
Columbus, Ohio 43266
(614) 728-3471
Cost: $1.00 each in the state of Ohio/$10.00 each elsewhere

While seemingly an older resource, these publications are excellent for teachers hoping to make their students better problem solvers. An overview of problem solving, strategies and approaches to problem solving are included in Volume 1. Volume 2 includes an introduction to teaching problem solving, research and psychological summaries, problem solving strategies, and teaching considerations. Ideas for getting started by using textbooks, acquiring, adapting, and generating good problems, as well as creating a problem solving environment and including calculators are part of this second volume. Both volumes include problems readily usable in the ABLE classroom.

GROUP SOLUTIONS: Cooperative Logic Activities for Grades K-4

Author: Jan M. Goodman
Publisher: GEMS (1992)
Great Explorations in Math and Science
Lawrence Hall of Science
University of California at Berkeley
Berkeley, CA 94720
(510) 642-7771
Cost: $17.00

This is a companion book to Get It Together: Math Problems for Groups, which was highly recommended in the original OLRC annotated bibliography. This is a collection of cooperative learning activities more appropriate for the pre-GED student. The information the group needs to solve a problem has been put on clue cards. Each member of the group has a different bit of information, so everyone has to cooperate to solve the problem. This is an exceptionally easy format for the teachers who want to begin using cooperative activities in mathematics with their lower level readers.

The first part of the book discusses *Cooperative Logic in the Classroom*, what it is, and how teachers make it work successfully. *Trouble-shooting* deals with common problems that may be faced in the beginning stages of cooperative logic and how to deal with them. *Cooperative Logic in Multilingual Classrooms* gives tips for teaching cooperative logic in an ESL setting. Finally, cooperative logic activities are presented, including an overview, material preparation, classroom management tips, introductory activities, assessment and extensions.

There are advantages to using cooperative learning activities both for the teacher and the students. The teacher has fewer units to supervise, and thus can spend more time observing the students and their progress as they begin to "own" their problem solving skills. Groups work appeals to more modalities and easily accommodates other disciplines in the math classroom. Success in problem solving is a morale booster. All students, in the ABLE classroom and in family or workplace literacy, benefit from learning to explain themselves more clearly and can work together on these activities. Learning to work together is an important life-skill in today's world.

USING MANIPULATIVES IN THE ADULT EDUCATION CLASSROOM

In order to help adult students with concept development and "mathematical sense making" it is suggested that manipulatives be incorporated into all classrooms. Manipulatives are not merely necessary for low level students; they facilitate learning and sense making for all students. Manipulatives must be used carefully, or they, too, will become another layer of misunderstanding. Not all manipulatives are necessary for every classroom. There are quality activities and strategies that can be used with many different manipulatives. The following books are recommended for use with the different manipulatives, which are often available inexpensively. It is hoped that adult education teachers will begin to see the benefits of using manipulatives in all levels of adult mathematics instruction.

LET'S PATTERN BLOCK IT

Authors: Peggy McLean, Lee Jenkins, and Jack McLaughlin
Publisher: Activity Resources Company, Inc. (1973)
P.O. Box 4875
Haywood, California 94540
Cost: $15.50

This book is designed for use with pattern blocks, which are standard sets of colored geometric shapes. A pattern block set includes a white rhombus, yellow hexagon, red trapezoid, orange square, blue rhombus, and green triangle. Activities included in this book include very basic identification, patterns, symmetry, geometry, games, and strategy puzzles. While the book may at first appear juvenile, it actually contains much material and many activities appropriate to the pre-GED and GED classroom.

FRACTIONS with Pattern Blocks

Author: Mathew E. Zullie
Publisher: Creative Publications (1988)
1300 Villa Street
Mountain View, CA 94941
Cost: $15.00

This book of activities is intended to help teachers and students understand concepts concerning fraction relationships and operations with fractions. The activities are to be used with a standard set of pattern blocks. Pages are perforated so they can be easily removed from the book and used as duplicating masters. Teachers are allowed to duplicate the materials for their own classes. Most of the activities are appropriate for adult students with a wide range of abilities. These manipulatives and activities help in introducing new concepts, reinforcing and clarifying concepts, and providing drill and practice in both the pre-GED and GED classroom.

Problem Solving with Pentominoes: Grades 1-4 Activity Book

Author: Alison Abrohms
Publisher: Learning Resources, Inc. (1992)
Lincolnshire, Illinois 60069
Cost: $11.00

Pentominoes are manipulatives formed from five squares. This book provides puzzle activities for students using these manipulatives. The book is geared to all levels of adult students and covers concepts needed for the GED. Activities focus on the mathematical concepts of transformations such as slides, turns, and flips and tessellations such as tiling, symmetry, area, perimeter, congruence, and similarity. Extensions for more challenging activities are included. Activities also promote cooperative learning.

SQUARE TILE: EXPLORATIONS AND PROBLEMS: Grades 4-9

Authors: Don Miller and Bishne Naraine
Publisher: Tricon Publishing (1995)
Mt. Pleasant, Michigan 48858
Cost: $12.00

This book is a wonderful resource that shows teachers how numbered or colored square tiles can be used to reinforce a variety of mathematical ideas via non-routine problem situations. Activities are designed to help students improve their mental and estimation skills, to challenge students via equations or familiar computational algorithms, to introduce geometric ideas, and to develop problem solving strategies using games. The main goal of all the activities is to provide students with experiences designed to improve their mathematical skills while helping them to become better problem solvers.

The mathematical content covered spans a wide ability range. It is particularly useful for students in pre-GED and GED level classes.

Note: While colored square tiles may be purchased, actual ceramic tiles may be obtained inexpensively through retail tile stores.